UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,534	07/24/2003	Tong Zhang	10018743	8212

			EXAMINER
22879	7590	10/19/2005	QIN, JIANCHUN

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ART UNIT	PAPER NUMBER
2837	

DATE MAILED: 10/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/625,534	ZHANG, TONG
	Examiner	Art Unit	
	Jianchun Qin	2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *15 August 2005*.

2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-42* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-3,10,15-23,27,29-35,38 and 40-42* is/are rejected.

7) ☒ Claim(s) *4-9,11-14,24-26,28,36,37 and 39* is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on *24 July 2003* is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail. Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 1, 2, 10, 34 and 38 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Goodman et al. (U.S. Pub. No. 20020147728) in view of Funaki (U.S.

Pat. No. 6525255).

With respect to claim 1:

Goodman et al. teach a method for automatic classification of music, comprising:

receiving a music piece to be classified (sections 0057 and 0060); determining when the

received music piece comprises human singing (sections 0053, 0057 and 0061);

labeling the received music piece as singing music when the received music piece is

determined to comprise human singing (sections 0024, 0055 and 0061); and labeling

the received music piece as instrumental music when the received music piece is not

determined to comprise human singing (sections 0024, 0055 and 0061).

Goodman et al. do not mention: using waveform analysis to determine when the

received music piece comprises human singing.

Funaki teaches a technique to isolate human singing signal from a received music piece using waveform analysis (col. 42, lines 22-36; cols. 46-47, lines 53-49).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the waveform based classification technique, as taught by Funaki, into the invention of Goodman et al. to reinforce Goodman's method step of determining when the received music piece comprises human singing in order to digitally classify a received music piece more accurately and efficiently for any type of input music piece (Funaki,col. 6, lines 34-40; cols. 14-15, lines 25-58).

With respect to claim 2:

Goodman et al. also teach: the received music piece is comprised of at least music sounds, and wherein the music piece can include one or more of audiovisual signals and/or non-music sounds (section 0057, lines 5-7).

With respect to claim 34:

Goodman et al. teach a computer readable medium encoded with software for automatically classifying a music piece (see Abstract), wherein the software is provided for determining when a music piece comprises human singing (sections 0053, 0057 and 0061); labeling the music piece as singing music when the music piece is determined to comprise human singing (sections 0024, 0055 and 0061); and labeling the music piece as instrumental music when the music piece is not determined to comprise human singing (sections 0024, 0055 and 0061).

Goodman et al. do not mention: using waveform analysis to determine when the received music piece comprises human singing.

Funaki teaches a technique to isolate human singing signal from a received music piece using waveform analysis (col. 42, lines 22-36; cols. 46-47, lines 53-49).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the waveform based classification technique, as taught by Funaki, into the invention of Goodman et al. to reinforce Goodman's method step of determining when the received music piece comprises human singing in order to digitally classify a received music piece more accurately and efficiently for any type of input music piece (Funaki,col. 6, lines 34-40; cols. 14-15, lines 25-58).

With respect to claims 10 and 38:

Claims 10 and 38 recite an intended use of the method and system for classification of music taught by Goodman et al. It has been held that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

3.   Claims 3 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goodman et al. (U.S. Pub. No. 20020147728) in view of Funaki, as applied to claims 1 and 34 above, and further in view of Petkovic et al. (U.S. Pat. No. 6185527).

Goodman et al. and Funaki teach a method and computer software for classification of music that includes the subject matter discussed above in accordance with claims 1 and 34. Goodman et al. and Funaki do not mention expressly: the presence of human singing on the received music piece is determined by analyzing a spectrogram of the received music piece.

Petkovic et al. disclose a method and system for classification of music, and teach that: the presence of human singing on a music piece is determined by analyzing a spectrogram of the music piece (col. 11, lines 23-30).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Petkovic et al. in the combination of Goodman et al. and Funaki in order to classify a music piece based on respective audio events associated with the spectral energy concentration of a portion of the audio signal (Petkovic et al., col. 4, lines 33-45, lines 50-52 and col. 5, lines 28-33).

4.   Claims 15-18 and 40-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goodman et al. in view of Funaki, as applied to claims 1 and 34 above, and further in view of Kanevsky et al. (U.S. Pat. No. 6434520).

Goodman et al. and Funaki teach a method and computer software for classification of music that includes the subject matter discussed above in accordance with claims 1 and 34. Goodman et al. further teach, regarding claim 17, the user selects a hierarchical structure of categories for controlling the classification of the music piece (section 0063).

Goodman et al. and Funaki do not mention expressly: regarding claims 15 and

40, the labeled music piece is written into a library of classified music pieces; regarding

claims 16 and 41, the labeling and/or the writing of the labeled music piece is controlled

by parameters selected by a user; and regarding claims 18 and 42, the labeled music

piece is written into a hierarchical database according to the structure selected by the

user and wherein the labeled music pieces in the hierarchical database can be browsed

according to the hierarchy.

Kanevsky et al. disclose a system and method for indexing and querying audio

archives, and teach the step and means of: when a music piece satisfies at least one

selected category, writing the labeled music piece into a library of classified music

pieces (col. 1, lines 54-56; col. 7, lines 21-39 and col. 8, lines 34-36); the labeling and/or

the writing of the labeled music piece is controlled by parameters selected by a user

(col. 7, lines 45-59); and the labeled music piece is written into a hierarchical database

according to the structure selected by the user (col. 7, lines 45-67) and wherein the

labeled music pieces in the hierarchical database can be browsed according to the

hierarchy (col. 9, lines 34-40).

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to include the teaching of Kanevsky et al. in the combination of

Goodman et al. and Funaki to obtain a library of classified music piece for the purpose

of efficient sorting and storing music pieces in their archives and facilitating subsequent

retrieval of desired information (Kanevsky et al., col. 1, lines 28-39).

5. Claims 19-22, 27 and 29-33 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Goodman et al. (U.S. Pub. No. 20020147728) in view of Funaki (U.S.

Pat. No. 6525255) and Kanevsky et al. (U.S. Pat. No. 6434520).

With respect to independent claim 19:

Goodman et al. teach a method for classification of music (see Abstract),

comprising: selecting parameters for controlling the classification of a music piece,

wherein the selected parameters establish a hierarchy of categories for classifying the

music piece (section 0024, 0049, 0053 and 0060); determining, in a hierarchical order

and for each selected category, when the music piece satisfies the category (section

0024, 0049, 0053 and 0060); labeling the music piece with each selected category

satisfied by the music piece (section 0024, 0049, 0053 and 0060).

Goodman et al. do not mention expressly: using waveform analysis to

determining when the music piece satisfies the category; and when the music piece

satisfies at least one selected category, writing the labeled music piece into a library

according to a hierarchy of the categories satisfied by the music piece.

Funaki teaches using waveform analysis to determining when a music piece

satisfies a given category (col. 42, lines 22-36).

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to incorporate the waveform based classification of music, as

taught by Funaki, into the invention of Goodman et al. to reinforce Goodman's method

step of determining when the music piece satisfies the category in order to digitally

classify a received music piece more accurately and efficiently for any type of input music piece (Funaki,col. 6, lines 34-40; cols. 14-15, lines 25-58).

Kanevsky et al. disclose a system and method for indexing and querying audio archives, and teach the step and means of, when a music piece satisfies at least one selected category, writing the labeled music piece into a library according to a hierarchy of the categories satisfied by the music piece (col. 1, lines 54-56; col. 7, lines 21-39 and col. 8, lines 34-36).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Kanevsky et al. in the invention of Goodman et al. to obtain the invention as specified in claim 19 in order to efficiently sort and store music pieces in their archives and to facilitate subsequent retrieval of desired information (Kanevsky et al., col. 1, lines 28-39).

With respect to claims 20 and 21:

Goodman et al., Funaki and Kanevsky et al. teach a method for classification of music that includes the subject matter discussed above in accordance with claim 19. Goodman et al. further teach, the categories include instrumental, singing music, symphony, a specific band, specific instrument music, other harmonic music, chorus, and vocal solo (section 0057).

Kanevsky et al. further teach: selecting parameters for subsequent browsing of the library for desired music pieces (col. 9, lines 34-40).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Kanevsky et al. in the invention of

Goodman et al. and Funaki in order to efficiently sort and store music pieces in their

archives and to facilitate subsequent retrieval of desired information (Kanevsky et al.,

col. 1, lines 28-39).

With respect to independent claims 22 and 31:

Goodman et al. teach a computer-based system for automatic classification of

music (see Abstract), comprising: a computer configured to determine when the

received music piece comprises human singing (sections 0053, 0057 and 0061); label

the received music piece as singing music when the received music piece is determined

to comprise human singing (sections 0024, 0055 and 0061); label the received music

piece as instrumental music when the received music piece is not determined to

comprise human singing (sections 0024, 0055 and 0061).

Goodman et al. do not mention expressly: a device configured to receive a music

piece to be classified; using waveform analysis to determine when the received music

piece comprises human singing; write the labeled music piece into a library of classified

music pieces.

Funaki teaches a technique to isolate human singing signal from a received

music piece using waveform analysis (col. 42, lines 22-36; cols. 46-47, lines 53-49).

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to incorporate the waveform based classification technique, as

taught by Funaki, into the invention of Goodman et al. to reinforce Goodman's method

step of determining when the received music piece comprises human singing in order to

digitally classify a received music piece more accurately and efficiently for any type of

input music piece (Funaki,col. 6, lines 34-40; cols. 14-15, lines 25-58).

Kanevsky et al. teach: a device configured to receive a music piece to be

classified (Fig. 2A, #200); and write the labeled music piece into a library of classified

music pieces (Fig. 2B, #213; col. 8, lines 34-36).

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to include the teaching of Kanevsky et al. in the invention of

Goodman et al. to obtain a library of classified music pieces for the purpose of efficiently

sorting and storing music pieces in their archives to facilitate subsequent retrieval of

desired information (Kanevsky et al., col. 1, lines 28-39).

With respect to claim 27:

Claim 27 recites an intended use of the method and system for classification of

music taught by Goodman et al. It has been held that a recitation of the intended use of

the claimed invention must result in a structural difference between the claimed

invention and the prior art in order to patentably distinguish the claimed invention from

the prior art. If the prior art structure is capable of performing the intended use, then it

meets the claim. In a claim drawn to a process of making, the intended use must result

in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ

235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

With respect to claims 29, 30, 32 and 33:

Goodman et al., Funaki and Kanevsky et al. teach a method and system for

classification of music that includes the subject matter discussed above in accordance

with claims 22 and 31. Goodman et al. further teach: regarding claim 30, an interface

configured to select parameters for controlling the classification of the music (section

0063); regarding claims 32 and 33, means for labeling the classified music piece as a

particular category of music (sections 0024, 0055 and 0061), and means for selecting

control parameters to control, adjust, and/or customize the classifying of the music

piece (section 0063).

Kanevsky et al. further teach, regarding claim 29, that the labeling and/or the

writing of the labeled music piece is controlled by parameters selected by a user (col. 7,

lines 45-59).

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to include the teaching of Kanevsky et al. in the invention of

Goodman et al. and Funaki in order to efficiently sort and store music pieces in their

archives and to facilitate subsequent retrieval of desired information (Kanevsky et al.,

col. 1, lines 28-39).

6.   Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over

Goodman et al. (U.S. Pub. No. 20020147728) in view of Funaki and Kanevsky et al.

(U.S. Pat. No. 6434520), as applied to claim 22 above, and further in view of Petkovic et

al. (U.S. Pat. No. 6185527).

Goodman et al., Funaki and Kanevsky et al. teach a method for classification of

music that includes the subject matter discussed above.

The combination of Goodman et al., Funaki and Kanevsky et al. does not mention expressly: the presence of human singing on the received music piece is determined by analyzing a spectrogram of the received music piece.

Petkovic et al. disclose a method and system for classification of music, and teach that: the presence of human singing on a music piece is determined by analyzing a spectrogram of the music piece (col. 11, lines 23-30).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Petkovic et al. in the combination of Goodman et al., Funaki and Kanevsky et al. in order to classify a music piece based on respective audio events associated with the spectral energy concentration of a portion of the audio signal (Petkovic et al., col. 4, lines 33-45, lines 50-52 and col. 5, lines 28-33).

Allowable Subject Matter

7.   Claims 4-9, 11-14, 24-26, 28, 36, 37 and 39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Reasons for Allowance

8.   The following is an examiner's statement of reasons for allowance:

The primary reason for the allowance of claims 4 and 24 is the inclusion of the limitation of classifying the labeled singing music piece as either chorus music or solo

music, based on frequency vibrations in the singing music piece. It is this limitation found in each of the claims, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

The primary reason for the allowance of claims 5-9, 25, 26, 36 and 37 is the inclusion of the limitation of classifying the labeled singing music piece as either chorus music or solo music, based on spectral peak tracks in the singing music piece. It is this limitation found in each of the claims, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

The primary reason for the allowance of claim 11 is the inclusion of the limitation that the symphony features include repetition, contrast, and variation of music signal or energy over time; sonata-allegro form; binary form; rondo form; regularities in movements; and alternating high and low volume intervals. It is this limitation found in each of the claims, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes this claim allowable over the prior art.

The primary reason for the allowance of claim 12 is the inclusion of the limitation of comparing the symphony music piece against one or more music segments exemplary of a specific band, wherein the symphony music piece is labeled as a specific band music piece if the symphony music piece matches at least one exemplary music segment. It is this limitation found in each of the claims, as it is claimed in the

combination that has not been found, taught or suggested by the prior art of record, which makes this claim allowable over the prior art.

The primary reason for the allowance of claims 13 and 14 is the inclusion of the limitation of: when the instrumental music piece has not been labeled as symphony, comprising: segmenting the instrumental music piece into notes by detecting note onsets; detecting harmonic partials for each segmented note, wherein if note onsets cannot be detected in most notes of the music piece and/or harmonic partials cannot be detected in most notes of the music piece, then labeling the instrumental music piece as other instrumental music. It is this limitation found in each of the claims, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

The primary reason for the allowance of claims 28 and 39 is the inclusion of the limitation that the labeled instrumental music piece is analyzed for occurrences of features indicative of symphonies, and wherein if at least one symphony feature is detected in the instrumental music piece, the instrumental music piece is labeled as symphony. It is this limitation found in each of the claims, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

Conclusion

9.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP §

706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR

1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.

Response to Arguments

10.   Applicant's arguments received 08/15/05 with respect to claims 1-42 have been

considered but are moot in view of the new ground(s) of rejection.

Claims 1-42 are rejected as new prior art reference (U.S. Pat. No. 6525255 to

Funaki) has been found to teach the limitations argued by the Applicant. Detailed

response is given in sections 2-6 as set forth above in this Office Action.

Contact Information

11.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Jianchun Qin whose telephone number is (571) 272-

5981. The examiner can normally be reached on 8am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, David Martin can be reached on (571) 272-2107. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Jianchun Qin
Examiner
Art Unit 2837

JQ
October 11, 2005

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